



## **Summary of Fishery Surveys Spider Lake, Iron County, 2013**

### **Survey Description**

The Mercer DNR Fisheries Management Team conducted the following fishery surveys on Spider Lake in 2013: early-spring fyke netting (May 10 – May 14; 22 net-nights of sampling effort) and electrofishing (May 14; 7.1 miles of shoreline surveyed), late-spring electrofishing (May 29; 6.0 miles of shoreline surveyed), and an early-summer fyke netting survey (June 10 – June 12; 8 net-nights of sampling effort). Walleye were the primary species targeted during the early-spring surveys, however, samples of the muskellunge, northern pike, and yellow perch populations were also obtained. Bass and panfish populations were targeted for assessment during the late-spring electrofishing survey, and the early summer netting survey provided supplemental information about the panfish populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society.

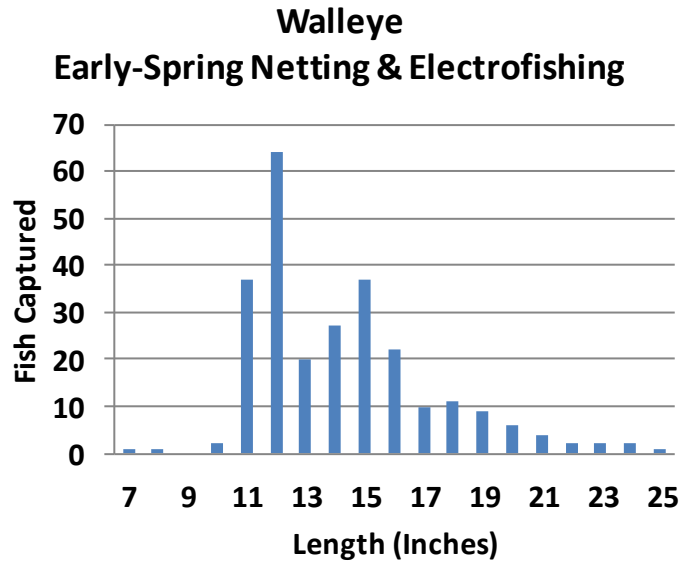
### **Habitat Characteristics**

Spider Lake is a 352-acre drainage lake (maximum and mean depths of 49 and 17 feet, respectively) with light brown-stained water and moderately high water clarity (Secchi disk transparency measurements averaging around 11 feet; WDNR citizen lake monitoring data 1998-2013). A public boat landing is available at the end of Pitt Road where the Turtle River inlet enters the lake. The littoral zone (near-shore area where light is able to penetrate to the lake bottom) substrates are comprised primarily of gravel, sand, and muck with aquatic vegetation primarily limited to shallow bays. Nutrient analyses (e.g., phosphorus) have typically shown that Spider Lake is moderately productive (mesotrophic).

### Walleye



Adult Population Estimate = 1.3/acre	
Quality Size $\geq 15''$	41%
Preferred Size $\geq 20''$	7%
Memorable Size $\geq 25''$	<1%

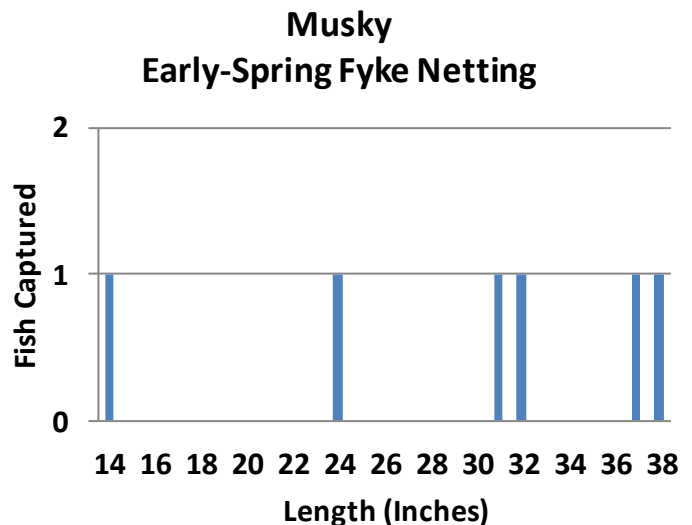


We captured 258 individual walleyes during the early-spring netting and electrofishing surveys at rates of 10.7/net-night and 16.9/mile, respectively. Using mark-recapture techniques, the population estimate for adult walleye in 352-acre Spider Lake was 473 fish, or 1.3 fish per surface acre of water. The Spider Lake walleye population has been sustained solely through natural reproduction since 1969, however, the adult walleye density (1.3 fish per acre) is below the typical northern Wisconsin range for naturally-reproducing populations (2—5 adults per acre). The size structure of the population is considered good, and it is indicative of a population that is sustained through natural reproduction.

### Muskellunge



Captured 0.2 per net-night $\geq 20''$	
Quality Size $\geq 30''$	80%
Preferred Size $\geq 38''$	20%
Memorable Size $\geq 42''$	0%

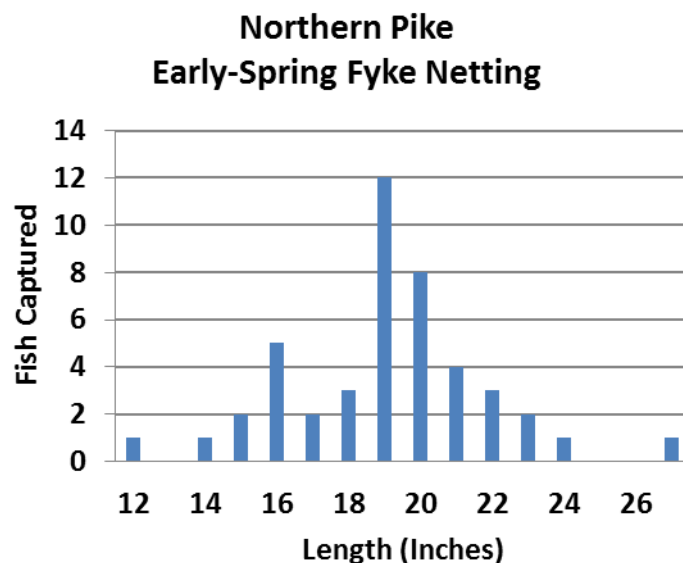


Muskellunge were not targeted during the early-spring netting survey (too early for optimal capture rates, and sampling occurred in spawning habitats not typically selected by muskellunge), however, fish  $\geq 20$  inches were captured at a low rate (0.2 per net-night). Although few fish were captured, the size structure of the sample matches our moderate expectations knowing that the fishery is sustained through natural reproduction. Undoubtedly, some larger musky also reside in Spider Lake.

### Northern Pike



Captured 2.1 per net-night $\geq 14''$	
Quality Size $\geq 21''$	25%
Preferred Size $\geq 28''$	0%

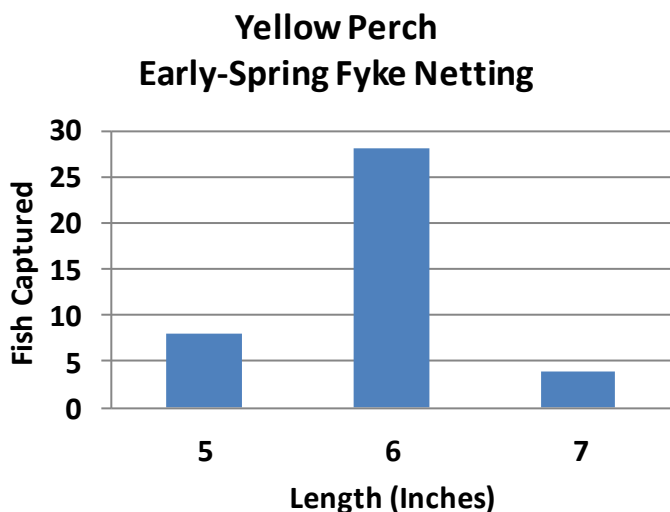


Although our nets were not set specifically to target northern pike, we caught them at a low-to-moderate rate during the early-spring netting survey. Size distribution in our sample was considered fair and is comparable to pike size structure parameters from similar lake-types.

### Yellow Perch



Captured 6 per net-night $\geq 5''$	
Quality Size $\geq 8''$	0%
Preferred Size $\geq 10''$	0%



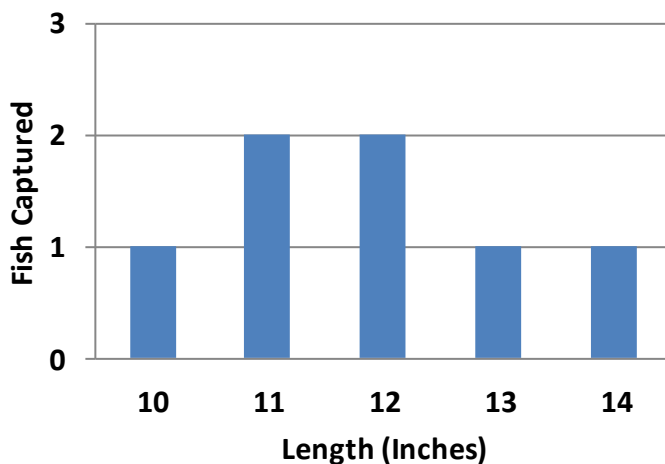
Yellow perch  $\geq 5$  inches were captured at a low rate of 6 per net-night during the early-spring fyke netting survey. Size structure of the population sample is considered very poor, with no fish observed above quality size. In support of these findings on the yellow perch population, the late-spring electrofishing and early-summer fyke netting surveys yielded similar results.

### Largemouth Bass



Captured 1.2 per mile $\geq 8''$	
Quality Size $\geq 12''$	57%
Preferred Size $\geq 15''$	0%

### Largemouth Bass Late-Spring Electrofishing



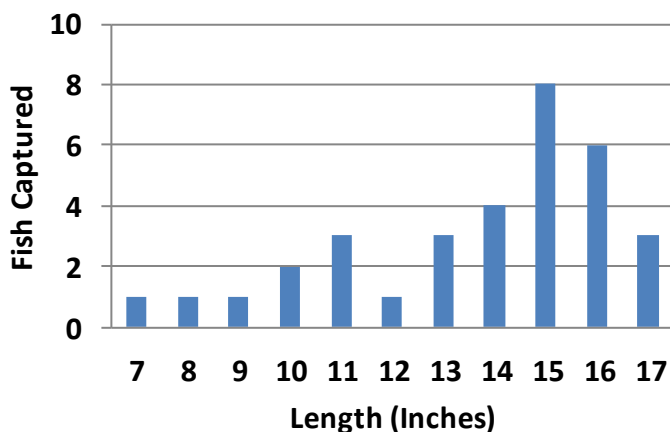
Largemouth bass  $\geq 8$  inches were captured at a low rate of 1.2 per mile during the late-spring electrofishing survey. Size structure of the population sample is considered poor, with no fish observed at preferred size.

### Smallmouth Bass



Captured 5.5 per mile $\geq 7''$	
Quality Size $\geq 11''$	85%
Preferred Size $\geq 14''$	64%
Memorable Size $\geq 17''$	9%

### Smallmouth Bass Late-Spring Electrofishing

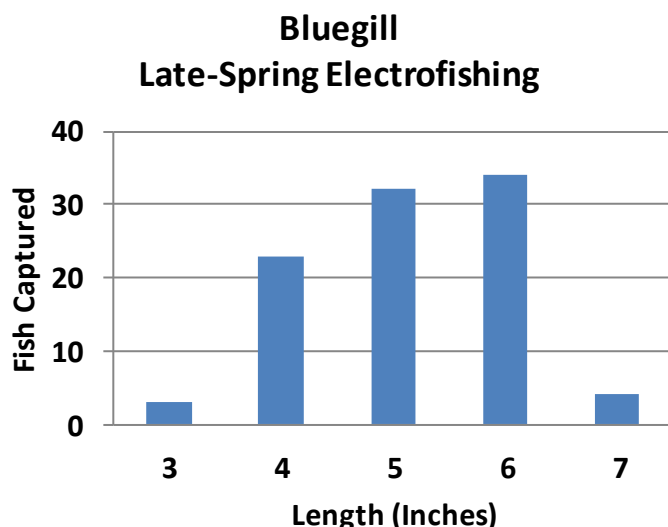


Smallmouth bass  $\geq 7$  inches were captured at a moderate rate of 5.5 per mile during the late-spring electrofishing survey. Size structure of the population sample is considered very good, with nearly two-thirds of the fish observed at, or above, preferred size.

### Bluegill



Captured 64 per mile $\geq 3''$	
Quality Size $\geq 6''$	40%
Preferred Size $\geq 8''$	0%

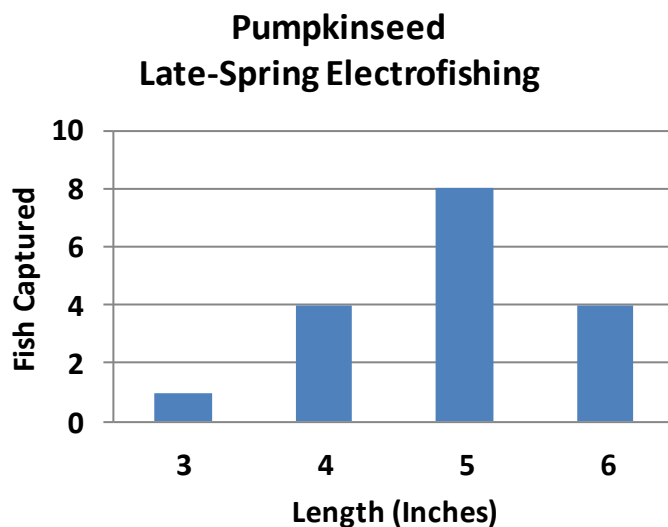


Bluegill  $\geq 3$  inches were captured at a moderate rate of 64 per mile during the late-spring electrofishing survey. The size distribution of our sample was fair; however few fish exceeded 7 inches in length. Bluegill  $\geq 3$  inches were captured at a relatively-high rate (144 per net-night) during the early-summer fyke netting survey, which differs somewhat from the results of the late-spring electrofishing survey; however, the size distributions of bluegill captured during the two surveys were nearly identical.

### Pumpkinseed



Captured 11 per mile $\geq 3''$	
Quality Size $\geq 6''$	24%
Preferred Size $\geq 8''$	0%

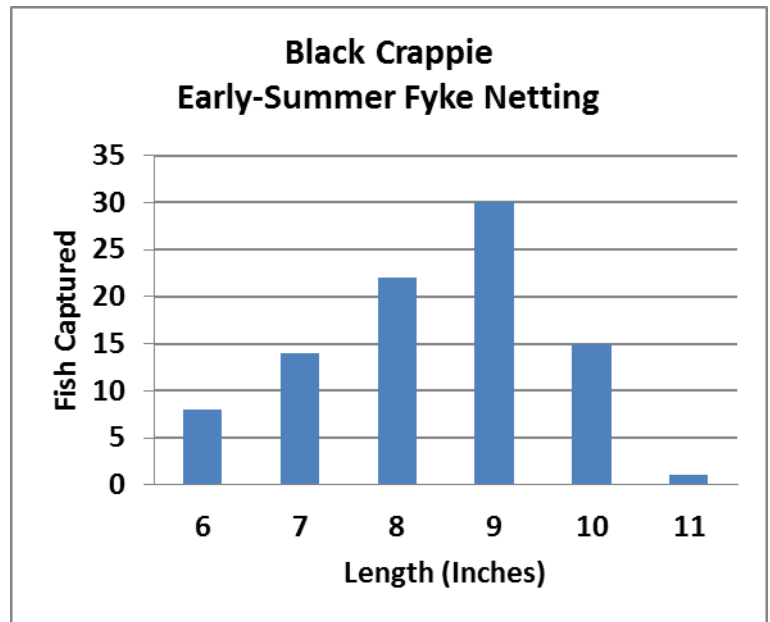


Pumpkinseed  $\geq 3$  inches were captured at a low rate of 11 per mile during the late-spring electrofishing survey. The size structure of the population sample was poor, with no fish being of an acceptable size to anglers. In support of these findings on the pumpkinseed population, the early-summer fyke netting survey yielded similar results.

### Black Crappie



Captured 13 per net-night $\geq 5''$	
Quality Size $\geq 8''$	76%
Preferred Size $\geq 10''$	18%



Black crappie were captured at a moderate rate (13 per net-night) during the early-summer fyke netting survey. Early-summer fyke netting may not be the best time for obtaining a representative sample of the crappie population, but our sample does reveal there are some crappies in Spider Lake of an acceptable size to anglers. In support of these findings, we also captured crappie at a moderate rate (20 per mile) during the late-spring electrofishing survey.

### Conclusions

Spider Lake contains a diverse, and relatively healthy, fish community. However, it appears that walleye and panfish populations may be enhanced through a minor adjustment. We have proposed that the current walleye regulation at Spider Lake (no minimum length limit, but only 1 fish over 14 inches may be harvested) revert back to the statewide minimum length limit (15 inches). The daily bag limit would remain at 5. If approved, the new length limit would take effect in spring of 2016.

Historical survey records indicate that Spider Lake had a strong, self-sustaining walleye population. Surveys conducted between the 1950s and late 1990s/early 2000s portrayed a walleye-dominant system characterized by high numbers of walleye (sustained by consistent natural reproduction) and low numbers of panfish. However, since the early to mid-2000s, the walleye population in Spider Lake has been reproducing at lower levels, and the current density of adult walleye (1.3 per acre) is now estimated to be about half of what it was in 1998 (2.7 per acre). Therefore, the current walleye regulation, which focuses harvest on smaller, younger fish, is counterproductive to maintaining a density high enough to sustain quality walleye fishing and to reliably control panfish.

Because of its walleye-dominant history, Spider Lake has been selected to serve as one of several important “reference lakes” in a formal evaluation of strategies to rehabilitate declining walleye populations in northern Wisconsin. Spider Lake was chosen as a project lake because it has favorable habitat for walleye reproduction and a fish community suited well for survival of young walleyes. Walleyes have not been stocked in Spider Lake since 1969; and as a result of its

“reference” role in the regional evaluation, walleyes will not be stocked in the near future. (Before we can conclude that stocking has or has not worked elsewhere, we must know if walleye populations have changed for other reasons in several reference lakes, including Spider, that are not stocked.) It appears that young walleyes naturally produced in 2012 will contribute significantly to the future adult population, provided they are not harvested prematurely. Being part of this evaluation will ensure more frequent monitoring of the population, including annual fall surveys to determine juvenile survival. The evaluation will be reviewed in five years to determine if the objectives are being met. If so, Spider will continue to serve as a reference lake. If not, we may at that time consider implementing additional strategies (e.g., stocking) to rehabilitate the population if the proposed rule-change alone does not produce the desired results. Because the new rule would not be implemented until 2016 (if approved), anglers are encouraged to use some discretion when it comes to harvesting walleye (i.e., release some currently legal-sized fish < 14 inches voluntarily).

Muskellunge are naturally recruiting in Spider Lake and have not been stocked since 1995. The survey results presented here are not intended to provide a thorough evaluation of the muskellunge population. However, in addition to this survey, other recent surveys and angler reports suggest that the muskellunge population remains healthy and is self-sustaining.

Spider Lake smallmouth bass offer anglers a high-quality fishing opportunity. Moderate numbers and a size distribution comprised primarily of larger fish suggest that anglers will have to put in a little effort to find smallmouth, but they will likely be rewarded with preferred-size fish. We captured few largemouth bass in Spider Lake.

Panfish populations appear to have increased in Spider Lake since the early 2000s. Survey statistics on bluegill now indicate that numbers may be so high that competition for food hinders growth rate and ultimate size attainment. (Growth analyses are needed to confirm this suspicion). Overabundant, slow-growing panfish populations with poor size distributions are typically a sign of insufficient predation. Re-establishment of a higher density of walleye (effective predators on small panfishes) in Spider Lake should help to reduce bluegill density and improve the overall quality of the panfishery. Size-selective angler harvest of perch combined with predation by esocids (muskellunge and northern pike) on the largest perch may be limiting perch size distribution. Anglers are encouraged to practice selective harvest strategies [e.g., voluntarily releasing some of the larger, rarer bluegills (> 7 inches), while harvesting some of the more abundant ones (< 6.5 inches)] in order to help improve panfishing quality in Spider Lake.

Rock bass, yellow bullhead, shorthead redhorse, white sucker, golden shiner, bluntnose minnow, logperch, mottled sculpin, and johnny darter were other species captured during our surveys.

Survey Data Collected and Analyzed By: Lawrence Eslinger, Jason Folstad, and Jim Zarzycki  
Special Thanks to John & Cheri Stratte of Pine Forest Lodge

Report By: Lawrence Eslinger, Fisheries Biologist, Iron County, 1/15/14

Edited and Approved By: Dave Neuswanger, Fisheries Supervisor, Hayward Field Unit, 1/28/14